

A Current-Mirrored Crystal-Oscillator Circuit Without Feedback to Reduce Power Consumption

Abstract

An oscillator inverter circuit has an input at a first crystal node and drives a second crystal node of a crystal oscillator. The first node is lightly loaded by a gate of an input transistor that generates a buffered node. The buffered node voltage is converted to a varying current by a converter transistor. Another varying current through upper and lower amplifier transistors are mirrored to upper and lower current mirror transistors. The gate and drain of the lower current mirror transistor are connected to the gate of an output transistor that pulls down the second node with low impedance. The drain of the upper current mirror transistor diverts current from an output current source, changing pull-up current to the second node through a p-channel transistor. An input resistor between the first node and the buffered node provides a DC bias but blocks AC oscillation signals.